

DESCRIPTION AND BIOLOGICAL NOTES ON THE LARVAE
OF PHRADONOMA TRICOLOR
(COLEOPTERA: DERMESTIDAE)

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Specimens of a *Dermestid* beetle which appeared to be a species of *Trogoderma* were collected from the hold of a ship in the Middle and Far East trade at Baltimore, Maryland, May, 1965, by E. J. Ford, Jr. and G. M. Prall. These insects were found in debris containing cumin seed (*Cuminum odoratum*), sesame seed (*Sesamum indicum*), peanut shells (*Arachis hypogaea*), other insects, burlap strands, paper bits, etc., and consisted of 2 male adults, 1 pupa, 1 larva, and 16 cast skins. All specimens were collected in a small area suggesting they were the same species. Further examination in the laboratory verified this association as follows: the 2 males were identified as *Phradonoma tricolor* (Arrow), the pupa found in the last larval skin (typical of the *Anthrenini*) had matured enough to be determined as a female of *P. tricolor*; this larval skin agreed in all important characters with the 16 cast skins and the larva.

Examination of other insects in the debris indicated that some organism had been feeding on the dead specimens. Assuming that the organism was the larvae of *Phradonoma* suggests that *Phradonoma* is not likely to be a pest of stored foods but may be found associated with these products when they are infested with other insects.

The genus *Phradonoma* Jacquelin du Val is very closely related to *Trogoderma* Berthold and distinguished in adults only by the presence of a row of strong teeth on the outer margin of the fore tibiae in *Phradonoma* (figs. 9 & 10). An additional character which may show some variation is that in the mesocoxal lines in *Phradonoma*, the lines extend nearly to the postero-lateral corners of the metasternum, but in the species of *Trogoderma* seen, these lines extend only half that distance.

The morphology of the larva of *Phradonoma* reflects the proximity of *Trogoderma* in that no consistent characters were found which are exclusively those of either genus. The interdigitation of characters suggests that *Phradonoma* might eventually be considered a species group of *Trogoderma*.

The following is apparently the first description of the larva of a species of *Phradonoma*.

Phradonoma tricolor (Arrow)

Mature larva: Length—6 mm., color light clear yellow to mahogany brown with anterior half of each thoracic and abdominal sternite slightly darker in the lightly colored specimens. Typical *Trogoderma*-like shape, legs and sternites as in *Trogoderma*. Erect spicasetae of each tergite mixed long and short, tending

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to be single-ranked; acrotergal setae long, $\frac{1}{3}$ to $\frac{1}{2}$ as long as tergite, all extending across acrotergal suture (fig. 2), no fine spicasetae anterior of medial row of erect spicasetae, no spicasetae inserted on posterior margins of tergites; hastisetal tufts dense on newly emerged larvae, but are easily abraded. Acrotergal sutures strong on all abdominal tergites and meso- and metathoracic tergites. Antennae with second segment nearly twice as long as first, terminal segment short (fig. 3a), occasionally bent at an angle (fig. 3b); inner face of basal segment with 4-7 short, curved setae scarcely extending beyond base of second segment which itself is devoid of setae in all specimens examined. Labrum as in fig. 1; distal sensory papillae as in figs. 5 or 6; proximal sensory pores 8 or 9.

Specimens deposited in U. S. National Museum.

Larvae of *Phradonoma tricolor* have been intercepted several times in eastern United States ports of entry. It apparently has not become established outside of the Middle East.

Comparative notes: The larvae of *Phradonoma tricolor* can be distinguished from the species of *Trogoderma* with a long second antennal segment by the following emendation to the key included by Beal, 1960 (p. 3, couplet 3, second choice):

	Spicasetae of seventh and eighth abdominal tergites not noticeably stouter than spicasetae of anterior tergites; submedian row of large spicasetae on these tergites more or less continuous; spicasetae not in compact separated groups of two or three -----	3a
3a	Sclerotized area on seventh abdominal tergum that bears hastisetal tuft separated from rest of tergum by narrow membranous area (somewhat as in <i>Anthrenus</i>) -----	
	-----TROGODERMA PRIMUM (Jayne)	
	Sclerotized area bearing hastisetal tuft not separated from rest of tergum -----	3b
3b	Distal sensory papillae arranged in a circular cup (fig. 7); third segment of antennae nearly as long as second (fig. 4)-----	
	-----TROGODERMA ANGUSTUM (Solier)	
	Distal sensory papillae as in fig. 5 or 6; third antennal segment less than $\frac{1}{2}$ as long as the second -----	
	-----PHRADONOMA TRICOLOR (Arrow)	

Only two known New World species of *Trogoderma*, *primum* and *ballfinchae* Beal, share the distinctive arrangement of distal papillae found in *P. tricolor*, but these can easily be distinguished by the characters in the emended key above. Two species doubtfully referred to *Trogoderma* by Beal (l.c., p. 24), *boganense* Armstrong and *carteri* Armstrong, have the same papillar arrangement but can easily be separated from other *Trogoderma* by the distinctive fiscisetae (Beal, l.c., fig. 7).

Trogoderma simplex Jayne is separated in the original Beal key.

Trogoderma angustum (Solier) perhaps most resembles *P. tricolor* in general appearance but can easily be distinguished by the arrangement of the distal papillae of the labrum, the relative lengths of the second and third antennal segments, the presence or absence of setae on the second antennal segment, and the relative length of the acrotergal setae. All of these characteristics are illustrated in the plate.

Orphinus fulvipes (Guerin) also has a "four plus two" arrangement of the distal papillae, but the segment containing four papillae is circular instead of C-shaped. This species is easily separated from the other species mentioned in this paper by the short second segment of the antennae and the separate sclerites bearing hastisetal tufts in the membrane posterior to the seventh abdominal tergite.

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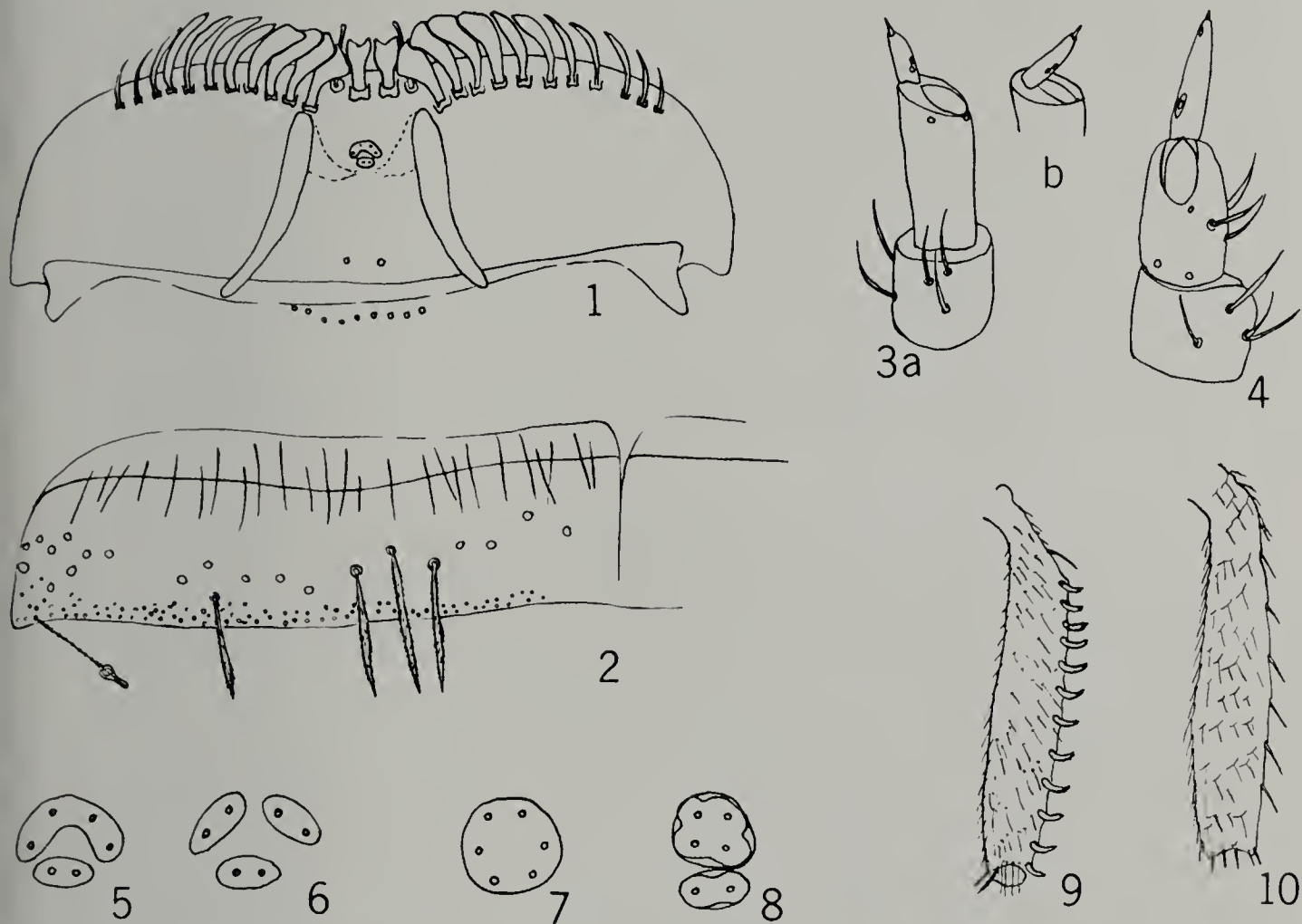
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FIGURES 1-3, 5, 6, *Phradonoma tricolor*, larva. 1—labrum. 2—abdominal tergite 2. 3a b—antenna. 5—normal distal sensory papillae of labrum. 6—fractured arrangement of sensory papillae of labrum.

FIGURES 4, 7, *Trogoderma angustum*, larva. 4—antenna. 7—distal papillae.

FIGURE 8, *Orphinus fulvipes*, larva. Distal papillae.

FIGURE 9, *Phradonoma*, adult. Fore tibia.

FIGURE 10, *Trogoderma*, adult. Fore tibia.